

AMENDMENTS TO THE CLAIMS

Listing of Claims:

Claims 1-12: Cancelled

Claim 13 (Currently amended): A heat dissipating fin comprising:

a longitudinally-extending base portion,
a first longitudinally-extending approximately circular side, and
a second longitudinally-extending approximately circular side,

wherein the length of the fin, L , is approximately $L = \frac{1}{\gamma} (1 - \sqrt{1 - \rho^2})$, where

$\gamma = \frac{h}{k}$ and $\rho = \frac{q_o}{k\theta_o}$, and where h is a heat transfer coefficient between the fin and a surrounding

fluid, k is a thermal conductivity of the material used to make the fin, q_o is a heat flow through
the fin semi-base per unit depth, and θ_o is a difference between a temperatures of a surface of the
fin and the surrounding fluid ~~wherein thermal energy received in the base portion is dissipated~~
~~from the outer surfaces of the first and second circular sides.~~

Claim 14 (Original): The fin according to claim 13, wherein the sides are defined by the
expression $\left(x - \frac{1}{\gamma}\right)^2 + \left(y - \frac{\rho}{\gamma}\right)^2 = \frac{1}{\gamma^2}$, where $\gamma = \frac{h}{k}$ and $\rho = \frac{q_o}{k\theta_o}$.

Claim 15 (Currently amended): The fin according to claim 13, wherein the cross-
sectional dimensions of the fin are defined by its base according to the semi-height dimension,
 y_o , a first arcuate side and a second arcuate side according to radius R , an arc length dimension
 S , and the length L , determined by the expressions $y_o = \frac{\rho}{\gamma}$, $R = \frac{1}{\gamma}$, $S = \frac{\sin^{-1} \rho}{\gamma}$, and

$$L = \frac{1}{\gamma} \left(1 - \sqrt{1 - \rho^2} \right), \text{ wherein } \gamma = \frac{h}{k}, \text{ and } \rho = \frac{q_o}{k\theta_o}.$$

Claim 16 (Original): The fin according to claim 13, wherein the fin is substantially straight over its width dimension.

Claim 17 (Original): The fin according to claim 13, wherein the fin is solid.

Claim 18 (Original): The fin according to claim 13, wherein the fin is homogeneous.

Claim 19 (Currently amended): The fin according to claim 13, wherein the fin is made from a material selected from the group consisting of aluminum, copper, iron, nickel, magnesium, titanium, ~~intermetallic~~ intermetallic alloys, refractory metals, ceramics, tool alloys, polymers, polymer composites, elastomers, epoxies, semi-conductors, glasses and metallic glasses.

Claim 20 (Currently amended): The fin according to claim 13, wherein [[the]] thermal energy received in the base portion [[and]] is dissipated from the outer surfaces of the first and second approximately circular sides ~~is dissipated~~ to a fluid surrounding the approximately circular sides.

Claims 21-22: Cancelled

Claims 23 (New): The fin according to claim 13, wherein the longitudinally-extending base portion is rectangular shape with the dimensions expressed by $2 \cdot (\rho / \gamma)$ times a length z of the fin in the longitudinal direction, where $\gamma = \frac{h}{k}$ and $\rho = \frac{q_o}{k\theta_o}$, and where h is a heat transfer coefficient between the fin and a surrounding fluid, k is a thermal conductivity of the

material used to make the fin, q_o is a heat flow through the fin semi-base per unit depth, θ_o is a difference between a temperatures of a surface of the fin and the surrounding fluid, and z is any value greater than zero.

Claim 24 (New): A heat dissipating fin for conducting thermal energy from a source to a fluid surrounding the fin, the fin comprising base and first and second side portions, wherein the width of the base portion, w , is approximately $w = 2 \cdot (\rho / \gamma)$, the length of the arc of the side portions, S , is approximately $S = \frac{\sin^{-1} \rho}{\gamma}$, the length of the fin, L , is approximately

$L = \frac{1}{\gamma} \left(1 - \sqrt{1 - \rho^2} \right)$, and wherein the first and second sides are approximately the shape of

$\left(x - \frac{1}{\gamma} \right)^2 + \left(y - \frac{\rho}{\gamma} \right)^2 = \frac{1}{\gamma^2}$, where $\gamma = \frac{h}{k}$, $\rho = \frac{q_o}{k\theta_o}$, h is a heat transfer coefficient between the

fin and the fluid, k is a thermal conductivity of the material used to make the fin, q_o is a heat flow through the fin semi-base per unit depth, and θ_o is a difference between a temperatures of a surface of the fin and the fluid.

Claim 25 (New): The fin according to claim 24, wherein the base and side portions form an enclosed substantially rectangle shape.

Claim 26 (New): The fin according to claim 24, wherein the fin is solid.

Claim 27 (New): The fin according to claim 24, wherein the fin is homogeneous.

Claim 28 (New): The fin according to claim 24, wherein the fin is made from a material selected from the group consisting of aluminum, copper, iron, nickel, magnesium, titanium, intermetallic alloys, refractory metals, ceramics, tool alloys, polymers, polymer composites, elastomers, epoxies, semi-conductors, glasses and metallic glasses.

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Claim 29 (New): The fin according to claim 24, wherein the thermal energy is received in the base portion and dissipated to the fluid through the outer surfaces of the first and second side portions.